

welcome

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transform your environment

LAKE ELLIS WATERSHED SURVEY



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ATHOL
MASSACHUSETTS

EPA/DEP FUNDED
604b GRANT

2020

LAKE ELLIS LOCUS ATHOL, MASSACHUSETTS

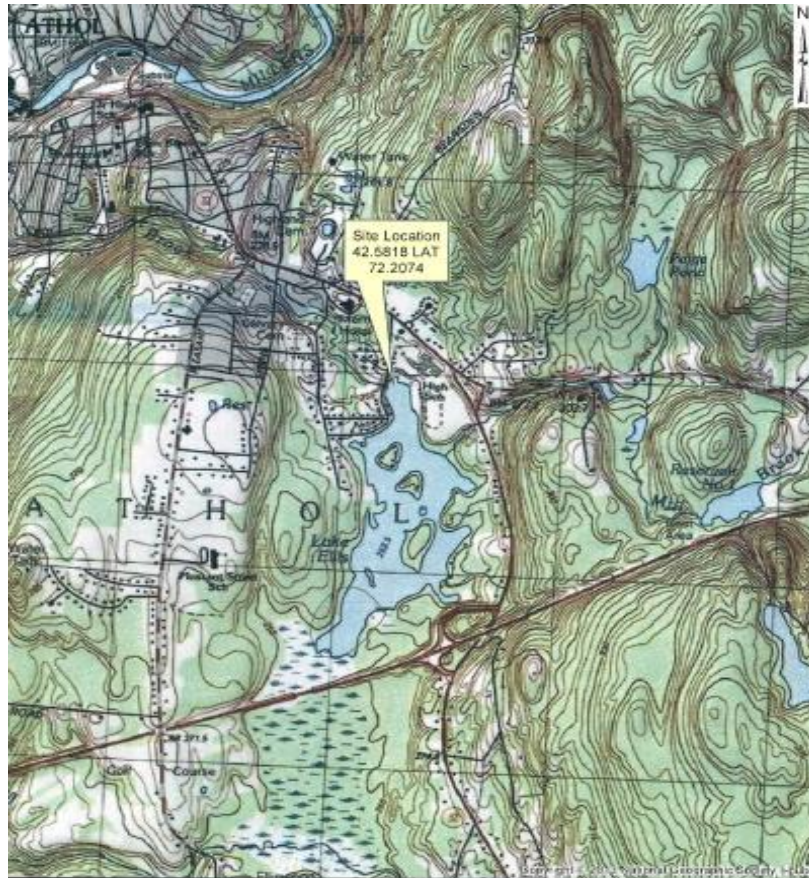


FIGURE 1
Lake Ellis
Athol, Massachusetts

Locus Map



Weston & Sampson

Lake Ellis Watershed Survey

Project Administrator – Eric Smith, Director, Athol Department of Planning & Community Development

Consultant Project Manager – Joe McGinn, Senior Project Manager, Weston & Sampson

QAPP/Evaluations of Alternative Control Measures – Sam Bade, PE, SSV Engineering, Certified MBE

Community Involvement/Coordination – Katherine Robertson, Certified WBE

The Athol/Lake Ellis Community and Stakeholders

Lake Ellis Watershed Survey

Purposes:

- Update the Characterization of the Lake Ellis Watershed
 - Confirm the Watershed Boundary Delineation
 - Update Land Use within the Drainage Area
- Assess Current Water Quality Conditions
- Confirm and Assess Water Quality Impairments
 - Aquatic Weeds
 - Phosphorus levels
 - Other Issues
- Evaluate Measures to Reduce/Eliminate Impairments and Achieve Use Objectives for Lake Ellis

LAKE ELLIS WATERSHED SURVEY

Consider Improvement Measures:

- Aquatic Weed Control Options:
 - Weed Harvesting
 - Herbicide Applications
 - Lake Level Drawdown
- Watershed Stormwater Best Management Practices (BMP's)
 - Structural BMP's
 - Non-Structural BMP's
- Restoration of Lake Outlet to Mill Brook

LAKE ELLIS WATERSHED SURVEY

- Other Issues:
 - Seasonal/Annual Lake Elevation
 - Localized flooding
 - Boating & other access limitations
- Impact of “forcing” water south to discharge to Ellinwood Brook
 - Starving downstream reaches of Mill Brook
 - Enhancing beaver habitat and seasonal high-water issues south of Route 2

Lake Ellis Watershed Survey

ATTACHMENT C PROJECT MILESTONE SCHEDULE

Lake Ellis Watershed Survey
Project 2019-06/604

MONTH

TASK	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Task #1 – Characterize Watershed	X	X	X																		
Task #2 – Prepare QAPP		X	X	X																	
Task #3 - Water Quality Sampling & Analysis				X	X	X	X	X	X	X	X	X									
Task #4 – Develop Watershed Based Plan											X	X	X	X	X	X					
Task #5 – Public Outreach	X	X	X									X	X	X	X	X				X	X
Task #6 - Quarterly & Final Reports			X			X			X			X			X			X			X

LAKE ELLIS WATERSHED SURVEY

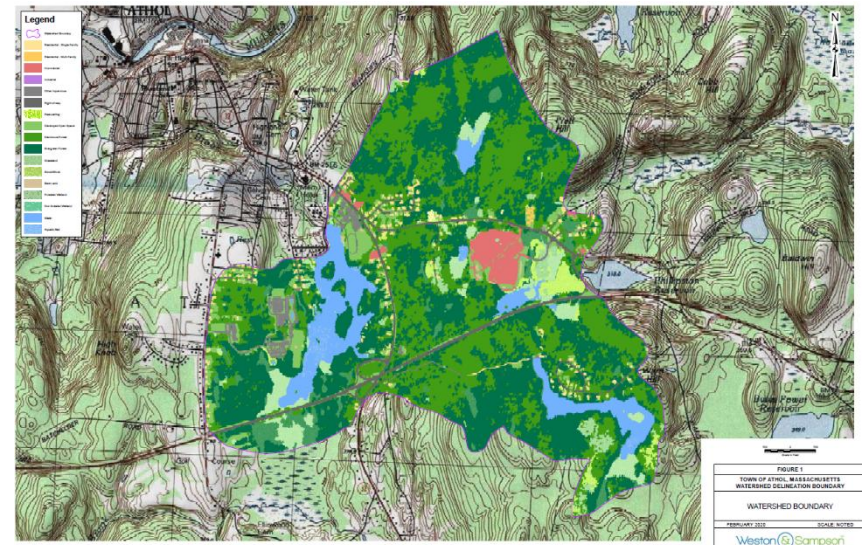
LAKE & WATERSHED CHARACTERISTICS

LAKE ELLIS WATERSHED CHARACTERISTICS

WATERSHED DRAINAGE AREA:	2087.268 ac	
LAKE SURFACE AREA:	64.88 ac	
WATERSHED:LAKE RATIO:	31:1	
DEPTH:	MEAN	3.9 ft 1.2 m
	MAX	10.8 ft 3.3 m
VOLUME:	269.6 ac-ft	3.32 x 10 ⁵ m ³
SHORELINE LENGTH:	2.37 mi	
WIDTH (max):	0.29 mi	
FETCH (max):	0.58 mi	
DETENTION TIME:	MEAN	16 Days 0.04 yrs
	RANGE	5 – 57 Days 0.014 – 0.15 yrs
Imperviousness:	147.2 ac	7.05%

LAKE ELLIS WATERSHED LAND USE

Land Use Category	Acres	%
Agriculture	39.315	1.9
Commercial	85.764	4.1
Forest	1331.98	63.8
Industrial	2.316	0.1
Open land	153.02	7.3
Recreation	10.439	0.5
Residential	167.14	8.0
Right-of-way	75.49	3.6
Tax exempt	58.19	2.8
Unknown	0.604	0.0
Water	163.01	7.8
TOTAL WATERSHED ACRES	2087.268	100.0



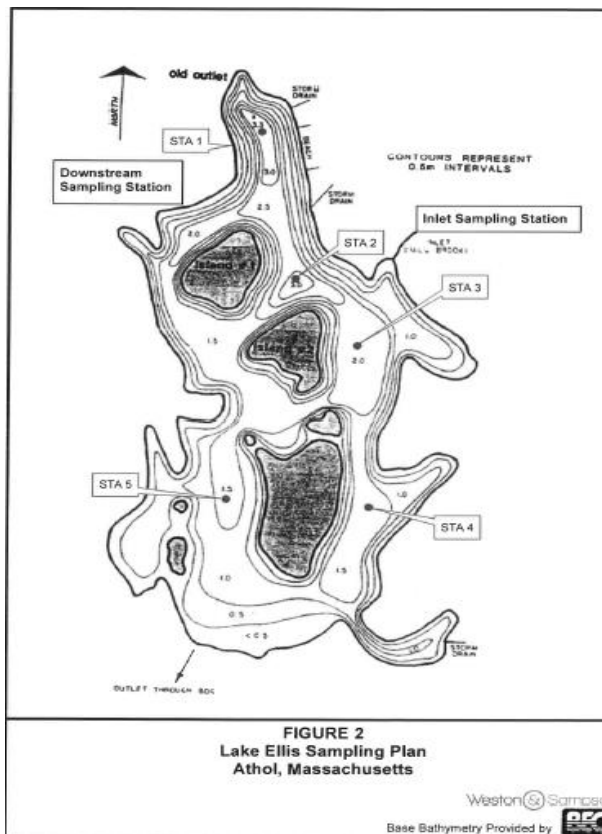
LAKE ELLIS WATERSHED SURVEY WATER QUALITY RESULTS - 1986

Lake Ellis Water Quality Data Summary
BEC 1986 Diagnostic/Feasibility Study – Station LE-2 – Surface

<u>Parameter</u>	<u>Units</u>	<u>Mean</u>	<u>Max</u>	<u>Min</u>
Temperature	Celsius		24.7	-1
Dissolved Oxygen	mg/L	9.8	13	6.7
pH	Std. Units		6	5
Conductivity	umhos/cm	153	240	69
Total Phosphorus	ug/L	16	47	10
Ortho Phosphorus	ug/L	11	18	10
Total Suspended Solids	mg/L	1.9	6.8	.1
Total Dissolved Solids	mg/L	87	128	11
Fecal Coliform	N/100ml	2	42	0
Chlorophyll a	ug/L	5.6	10.7	1.8
Secchi Depth	Meters	2.8	3.1	2.1

LAKE ELLIS WATERSHED SURVEY SAMPLING PLAN

SAMPLING STATION LOCATIONS



WATER QUALITY SURVEY PARAMETERS

- SECCHI DEPTH
- TEMPERATURE
- pH
- CONDUCTIVITY
- DISSOLVED OXYGEN

- TOTAL PHOSPHORUS
- ORTHOPHOSPHORUS
- TOTAL SUSPENDED SOLIDS
- TOTAL DISSOLVED SOLIDS
- CHLOROPHYLL a

- FECAL COLIFORM
- E. COLI.

LAKE ELLIS WATERSHED SURVEY

Water Quality Sampling Plan

- Three Sampling Events:
 - May, July and September
 - Covering the recreation and growing season
- Sample collection – Weston & Sampson w/ Assistance from Town of Athol
- Laboratory Analysis – Rhode Island Analytical Labs, Hudson MA

LAKE ELLIS WATERSHED SURVEY PUBLIC INVOLVEMENT PROGRAM

- WE WANT TO HEAR FROM YOU!
 - WHAT'S IMPORTANT TO YOU?
 - HAVE WE CAPTURED THE MOST CRITICAL ISSUES FACING LAKE ELLIS?
 - HOW CAN YOU CONTACT THE PROJECT TEAM?

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Eric Smith, Athol Planning & Community Development,
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LAKE ELLIS WATERSHED SURVEY

Questions?

Comments?

Thank you for your participation!

thank you
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